

# New onset diabetes after transplant (NODAT)

Information for families

Great Ormond Street Hospital  
for Children NHS Foundation Trust

**This information sheet from Great Ormond Street Hospital (GOSH) explains the causes, symptoms and treatment of new onset diabetes after transplant (NODAT), and where to get help.**

## **What is new onset diabetes after transplant (NODAT)?**

New onset diabetes after transplant (NODAT) affects between 3 and 13 per cent of children and young people who have an organ transplant. The medicines needed to prevent the body rejecting the organ also affect insulin production and uptake.

## **What is insulin?**

Insulin is a hormone, which controls the concentration of glucose (sugar) in the blood. Insulin is released by beta-cells in the pancreas. Normally, the beta-cells release insulin in response to the concentration of glucose in the blood. Glucose is the body's energy source and the insulin transports the glucose into the cells where it is needed.

When there is a high concentration of blood glucose, the beta-cells release more insulin to allow the glucose to be absorbed from the blood. If there is a low concentration of glucose, the beta-cells release a much smaller amount of insulin or even switch off insulin production. This keeps the blood glucose concentration balanced and at the right concentration for the rest of the body to function normally.

## What causes new onset diabetes after transplant (NODAT)?

The medicines needed to prevent the body rejecting the transplanted organ – immunosuppressant medicines – also affect how insulin is produced and how the body reacts to it. We currently use a combination of immunosuppressants. The most common include: prednisolone, tacrolimus, azathioprine and mycophenolate mofetil (MMF). Each type affects the body in different ways.

### Steroids (prednisolone)

The liver reduces the amount of glucose it releases in response to insulin. Steroids make the liver less sensitive to insulin so it carries on releasing glucose even if the pancreas is releasing insulin. Steroids also stop glucose being absorbed by muscle and fat in the body so it circulates in the blood stream. Steroids reduce the body's sensitivity to insulin and therefore more insulin is required to transport the glucose into the cells.

### Calcineurin inhibitors (tacrolimus)

The pancreatic beta-cells release insulin in response to the amount of glucose in the blood. If the blood glucose is high more insulin is released to bring them down to a normal range. Calcineurin inhibitors prevent beta-cells from making insulin efficiently and so the blood glucose may remain high and therefore lead to a diagnosis of diabetes.

## What are the signs and symptoms of new onset diabetes after transplant (NODAT)?

The signs and symptoms of NODAT are the same as for other types of diabetes. These can include:

- Dry mouth
- Thirst
- Increased urination (peeing)
- Feeling tired
- Weight loss

Some people can have high blood glucose concentration without showing any symptoms. This is why it is important to have regular blood tests to measure the concentration of glucose in the blood.

## How is new onset diabetes after transplant (NODAT) diagnosed?

NODAT is diagnosed with a finger prick test for a small sample of blood to look at the blood glucose concentration and this will be checked by your specialist team as an inpatient or outpatient. If your child or young person has a fasting blood glucose above 7mmol/L or a random blood glucose above 11.1mmol/L, they have diabetes.

## How is new onset diabetes after transplant (NODAT) treated?

NODAT is treated with insulin injections. Your child will need to check their blood glucose concentration regularly and adjust their insulin dose if needed. Our Clinical Nurse Specialist for Diabetes will teach you and your child how to manage their diabetes.

Your child may have to adjust their diet as well to help manage their blood glucose concentration. We will arrange for your child to see a Diabetes Specialist Dietitian to understand how best to manage diet and diabetes.

The specialist team monitoring your child's transplant will also be involved, as adjusting the dose and/ or type of immunosuppressant medicines may improve blood glucose concentration.

## What happens next?

Your child will have regular blood tests as part of their long term follow up after transplant, both to monitor blood glucose concentration and also the levels of immunosuppressant in the body. Your doctor will discuss with you whether there are alternative medicines your child could take to manage their condition.

## Further information and support

Call our **Clinical Nurse Specialist for Diabetes** on

020 7405 9200 ext. 1597

or Diabetes Specialist Dietitian

on 020 7405 9200 ext. 5941

## Notes

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